



## SEQUENCE LISTING

<110> ARNOULD-REGUIGNE, ISABELLE  
PRADES, CATHERINE  
NAUDIN, LAURENT  
LEMOINE, CENDRINE  
DEAN, MICHAEL  
DENEFLÉ, PATRICE  
ROSIER-MONTUS, MARIE-FRANCOISE

<120> NUCLEIC ACIDS OF THE HUMAN ABCA12 GENE, VECTORS  
CONTAINING SUCH NUCLEIC ACIDS AND USES THEREOF

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<141> 2002-02-12

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<170> PatentIn version 3.3

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60  
120

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| cacctaaga   | tgaatatctt  | aatttattac  | tttcaataaaa | aagacagttt | aaaaggcaaa  | 8340 |
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 <211> 8113  
 <212> DNA  
 <213> Homo sapiens

|             |             |              |             |             |              |      |
|-------------|-------------|--------------|-------------|-------------|--------------|------|
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| aaacagaaga  | actgtgggt   | tcttacccca   | gccctcaagg  | aagctatgcc  | gtgaaagggg   | 120  |
| tactgataca  | ctgacataca  | gcaagggttga  | cggggcatca  | gttcttcatt  | tgtggagtgg   | 180  |
| agaaaagaag  | aggaaatctc  | tcatttgggg   | catttgaagg  | atggcttccc  | tgtttcatca   | 240  |
| gttccagatc  | ctggctgttga | aaaatggct    | aggtgtaaaa  | aggcagccgc  | tttggacact   | 300  |
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| ctttccattc  | ctgcagaccc  | tactctgtga   | cacagactt   | aatgcaaag   | acacacccta   | 480  |
| tggcccacaa  | gatctgttc   | gttagggaaagg | aattgtatgt  | gcactattt   | aagacagtga   | 540  |
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| aactgtggaa  | gaacattttgt | atttctatgc  | cagggtacat    | ggaattccag   | aaaaggatata | 7080 |
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| tacctctatg  | tgcagtatg   | gcacaaaaag  | aaaattatcc    | actgcactgg   | ccttgcatagg | 7200 |
| gaaacccTCC  | attctactgc  | tggatgagcc  | gagctctggc    | atggatccga   | agtcgaaacg  | 7260 |
| gcacccTCTG  | aaagatcattt | cagaagaatg  | acagaacaaa    | tgttccgtca   | tcctcacatc  | 7320 |
| tcacagcatg  | gaagaatgtg  | aagctctgt   | taccagg       | gttgcattatgg | tgatggaaa   | 7380 |
| gtttcaatgt  | attggatctt  | tgcagcacat  | aaagaggcagg   | tttggacgag   | gatttactgt  | 7440 |
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| gcactttcca  | aaaacataact | taaaagatca  | gcacctcagc    | atgctagatg   | atcatgtacc  | 7560 |
| agtcacagca  | ggaggagtgc  | caaacatTTT  | tgatctgctg    | gaaaccaaca   | agactgctt   | 7620 |
| aaatattaca  | atttcttag   | tgagtcagac  | cactctggaa    | gaggtttca    | tcaactttgc  | 7680 |
| caaagaccag  | aagtccatag  | aaactgctga  | taccagcagc    | caaggttcca   | ctataagtgt  | 7740 |
| tgactcaca   | gatgaccaga  | tggagtctt   | acacttccag    | caaactcaat   | tcagcgtgt   | 7800 |
| gaccaatggc  | ttcattttga  | agaaaagcca  | cagaagatac    | acttccgcaa   | gatacttca   | 7860 |
| ttttaaagta  | aagtaatata  | ctgtatggaa  | agttacaact    | gtgttagact   | aacaagtaat  | 7920 |
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| tgtatactca  | acactgtgag  | catgctaatt  | tatatgtctgg   | tgattttat    | gaaaggtga   | 8040 |
| agccacactca | agatgaatat  | cttaattt    | tactttcaat    | aaaaagacag   | tttaaaaggc  | 8100 |
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Pro Thr Ala Lys Pro Thr Cys Tyr Leu Ala Pro Arg Asn Leu Pro Ser
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Thr Gly Phe Phe Pro Phe Leu Gln Thr Leu Leu Cys Asp Thr Asp Ser
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Gly Ile Asp Asp Ala Leu Phe Lys Asp Ser Glu Ile Leu Arg Lys Ser
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Ser Asn Leu Asp Lys Asp Ser Ser Leu Ser Phe Gln Ser Thr Gln Val
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Pro Glu Arg Arg His Ala Ser Leu Ala Thr Val Phe Pro Ser Pro Ser
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Ser Asp Leu Glu Ile Pro Gly Thr Tyr Thr Phe Asn Gly Ser Gln Val
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Leu Ala Arg Ile Leu Gly Leu Glu Lys Leu Leu Lys Gln Asn Ser Thr
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Ser Glu Asp Ile Arg Arg Glu Leu Cys Asp Ser Tyr Ser Gly Tyr Ile
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Val Asp Asp Ala Phe Ser Trp Thr Phe Leu Gly Arg Asn Val Phe Asn
195 200 205

Lys Phe Cys Leu Ser Asn Met Thr Leu Leu Glu Ser Ser Leu Gln Glu
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Leu Asn Lys Gln Phe Ser Gln Leu Ser Ser Asp Pro Asn Asn Gln Lys
225 230 235 240

Ile Val Phe Gln Glu Ile Val Arg Met Leu Ser Phe Phe Ser Gln Val
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Gln Glu Gln Lys Ala Val Trp Gln Leu Leu Ser Ser Phe Pro Asn Val
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Phe Gln Asn Asp Thr Ser Leu Ser Asn Leu Phe Asp Val Leu Arg Lys  
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 Thr Asn Glu Gly Phe Arg Thr Leu Gln Lys Ser Val Lys His Leu Leu  
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 Tyr Thr Leu Asp Ser Pro Ala Gln Gly Asp Ser Asp Asn Ile Thr His  
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 Val Trp Asn Glu Asp Asp Gly Gln Thr Leu Ser Pro Ser Ser Leu Ala  
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 Ala Glu Ile Ile Ser Gln Val Phe Trp Leu His Ser Cys Asp Thr Asn  
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Gly Leu Asp Ala Val Glu Leu Leu Lys Gln Ile Asp Glu Leu Asp Ile  
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Pro Ser Asn Arg Ser Trp His Arg Gly Tyr Asp Ser Gly Asn Val Phe  
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Leu Pro Pro Val Ile Lys Tyr Thr Ile Arg Met Ser Leu Lys Thr Ala  
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Gln Thr Thr Arg Ser Leu Arg Thr Lys Ile Trp Ala Pro Gly Pro His  
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Asn Ser Pro Ser His Asn Gln Ile Tyr Gly Arg Ala Phe Ile Tyr Leu  
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Gln Asp Ser Ile Glu Arg Ala Ile Ile Glu Leu Gln Thr Gly Arg Asn  
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Ser Gln Glu Ile Ala Val Gln Val Gln Ala Ile Pro Tyr Pro Cys Phe  
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Met Lys Asp Asn Phe Leu Thr Ser Val Ser Tyr Ser Leu Pro Ile Val  
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Leu Met Val Ala Trp Val Val Phe Ile Ala Ala Phe Val Lys Lys Leu  
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Val Asn Ser Cys Ser His Phe Phe Ala Trp Leu Ile Glu Ser Val Gly  
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Val Tyr Val Leu Pro Pro Phe Ser Thr Lys Val Ser Gly Ala Tyr Leu  
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Cys Tyr Gly Ile Ser Asp Thr Thr Val Glu Glu Val Phe Leu Asn Leu  
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Thr Lys Glu Ser Gln Lys Asn Ser Ala Met Ser Leu Glu His Leu Thr  
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Gln Lys Lys Ile Gly Asn Ser Asn Ala Asn Gly Ile Ser Thr Pro Asp  
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 Thr Val His Lys Leu Leu Arg Arg Leu His Leu Met Pro Phe Lys Asp  
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Met Glu Glu Cys Glu Ala Leu Cys Thr Arg Leu Ala Ile Met Val Asn  
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Gly Arg Gly Phe Thr Val Lys Val His Leu Lys Asn Asn Lys Val Thr  
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Met Glu Thr Leu Thr Lys Phe Met Gln Leu His Phe Pro Lys Thr Tyr  
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Val Phe Ile Asn Phe Ala Lys Asp Gln Lys Ser Tyr Glu Thr Ala Asp  
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Lys Cys Lys Asp Thr Pro Tyr Gly Pro Gln Asp Leu Leu Arg Arg Lys  
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Gly Ile Asp Asp Ala Leu Phe Lys Asp Ser Glu Ile Leu Arg Lys Ser  
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Ser Asn Leu Asp Lys Asp Ser Ser Leu Ser Phe Gln Ser Thr Gln Val  
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Ser Glu Asp Ile Arg Arg Glu Leu Cys Asp Ser Tyr Ser Gly Tyr Ile  
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Val Asp Asp Ala Phe Ser Trp Thr Phe Leu Gly Arg Asn Val Phe Asn  
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Lys Phe Cys Leu Ser Asn Met Thr Leu Leu Glu Ser Ser Leu Gln Glu  
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Leu Asn Lys Gln Phe Ser Gln Leu Ser Ser Asp Pro Asn Asn Gln Lys  
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Ile Val Phe Gln Glu Ile Val Arg Met Leu Ser Phe Phe Ser Gln Val  
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Gln Glu Gln Lys Ala Val Trp Gln Leu Leu Ser Ser Phe Pro Asn Val  
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Phe Gln Asn Asp Thr Ser Leu Ser Asn Leu Phe Asp Val Leu Arg Lys  
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Ala Asn Ser Val Leu Leu Val Val Gln Lys Val Tyr Pro Arg Phe Ala  
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Thr Asn Glu Gly Phe Arg Thr Leu Gln Lys Ser Val Lys His Leu Leu  
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Tyr Thr Leu Asp Ser Pro Ala Gln Gly Asp Ser Asp Asn Ile Thr His  
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Ile Glu Lys Ser Cys Gln Leu Ser Asp Met Ser Phe Gly Ser Leu Cys  
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Glu Glu Ser Glu Phe Asp Leu Gln Leu Leu Glu Ala Ala Glu Leu Gly  
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Lys Val Arg Asp Leu Leu Thr Gly Asp Pro Ser Lys Ile Asn Leu Asn  
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Ser Ala Asp Ala Ser Glu Lys Pro Gly Gln Leu Leu Glu Met Phe Lys  
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Asn Val Glu Glu Leu Lys Glu Asp Leu Arg Arg Thr Thr Gly Met Ser  
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Asn Arg Thr Ile Asp Lys Leu Leu Ala Ile Pro Ile Pro Asp Asn Arg  
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Ala Glu Ile Ile Ser Gln Val Phe Trp Leu His Ser Cys Asp Thr Asn  
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Ile Thr Thr Pro Lys Leu Glu Asp Ala Met Lys Glu Phe Cys Asn Leu  
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 Asp Lys Met Arg Ser Leu Lys Gln Met His Leu Pro Arg Ser Val Pro  
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 Ser Lys Tyr Gly Ile Pro Ile Asn Thr Thr Pro Phe Cys Phe Ser Leu  
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 Arg Ile Gln Ala Ala Lys Thr Ile Asp Glu Met Glu Arg Glu Ala Lys  
 930 935 940

Arg Leu Tyr Lys Ser Asn Glu Leu Phe Gly Ser Val Ile Phe Lys Leu  
 945 950 955 960

Pro Ser Asn Arg Ser Trp His Arg Gly Tyr Asp Ser Gly Asn Val Phe  
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Leu Pro Pro Val Ile Lys Tyr Thr Ile Arg Met Ser Leu Lys Thr Ala  
 980 985 990

Gln Thr Thr Arg Ser Leu Arg Thr Lys Ile Trp Ala Pro Gly Pro His  
 995 1000 1005

Asn Ser Pro Ser His Asn Gln Ile Tyr Gly Arg Ala Phe Ile Tyr Leu  
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Gln Asp Ser Ile Glu Arg Ala Ile Ile Glu Leu Gln Thr Gly Arg Asn  
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Ser Gln Glu Ile Ala Val Gln Val Gln Ala Ile Pro Tyr Pro Cys Phe  
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Met Lys Asp Asn Phe Leu Thr Ser Val Ser Tyr Ser Leu Pro Ile Val  
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Leu Met Val Ala Trp Val Val Phe Ile Ala Ala Phe Val Lys Lys Leu  
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Val Tyr Glu Lys Asp Leu Arg Leu His Glu Tyr Met Lys Met Met Gly  
 1090 1095 1100

Val Asn Ser Cys Ser His Phe Phe Ala Trp Leu Ile Glu Ser Val Gly  
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Phe Leu Leu Val Thr Ile Val Ile Leu Ile Ile Leu Lys Phe Gly  
 1125 1130 1135

Asn Ile Leu Pro Lys Thr Asn Gly Phe Ile Leu Phe Leu Tyr Phe Ser  
 1140 1145 1150

Asp Tyr Ser Phe Ser Val Ile Ala Met Ser Tyr Leu Ile Ser Val Phe  
 1155 1160 1165

Phe Asn Asn Thr Asn Ile Ala Ala Leu Ile Gly Ser Leu Ile Tyr Ile  
 1170 1175 1180

Ile Ala Phe Phe Pro Phe Ile Val Leu Val Thr Val Glu Asn Glu Leu  
 1185 1190 1195 1200

Ser Tyr Val Leu Lys Val Phe Met Ser Leu Leu Ser Pro Thr Ala Phe  
 1205 1210 1215

Ser Tyr Ala Ser Gln Tyr Ile Ala Arg Tyr Glu Glu Gln Gly Ile Gly  
 1220 1225 1230

Leu Gln Trp Glu Asn Met Tyr Thr Ser Pro Val Gln Asp Asp Thr Thr  
 1235 1240 1245

Ser Phe Gly Trp Leu Cys Cys Leu Ile Leu Ala Asp Ser Phe Ile Tyr  
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 Phe Leu Ile Ala Trp Tyr Val Arg Asn Val Phe Pro Gly Thr Tyr Gly  
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 Met Ala Ala Pro Trp Tyr Phe Pro Ile Leu Pro Ser Tyr Trp Lys Glu  
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 Arg Phe Gly Cys Ala Glu Val Lys Pro Glu Lys Ser Asn Gly Leu Met  
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 Phe Thr Asn Ile Met Met Gln Asn Thr Asn Pro Ser Ala Ser Pro Glu  
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 Tyr Met Phe Ser Ser Asn Ile Glu Pro Glu Pro Lys Asp Leu Thr Val  
 1330 1335 1340  
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 Gly Leu Phe Gly Ala Ser Ala Gly Thr Ile Phe Val Tyr Gly Lys Asp  
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 Gln His Asp Val Leu Phe Ser Tyr Leu Thr Thr Lys Glu His Leu Leu  
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 His Lys Arg Val Gly Thr Leu Ser Gly Gly Met Lys Arg Lys Leu Ser  
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 Trp Asp Phe Pro Gly Ile Asp Asn Met Cys Leu Asn Thr Ser Asp Leu  
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 Gln Cys Leu Asn Lys Asp Ser Leu Glu Lys Trp Asn Thr Ser Gly Glu  
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 Pro Ile Thr Asn Phe Gly Val Cys Ser Cys Ser Glu Asn Val Gln Glu  
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 Cys Pro Lys Phe Asn Tyr Ser Pro Pro His Arg Arg Thr Tyr Ser Ser  
 1780 1785 1790  
 Gln Val Ile Tyr Asn Leu Thr Gly Gln Arg Val Glu Asn Tyr Leu Ile  
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 Ser Thr Ala Asn Glu Phe Val Gln Lys Arg Tyr Gly Gly Trp Ser Phe  
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 Gly Leu Pro Leu Thr Lys Asp Leu Arg Phe Asp Ile Thr Gly Val Pro  
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 Ala Asn Arg Thr Leu Ala Lys Val Trp Tyr Asp Pro Glu Gly Tyr His  
 1845 1850 1855

Ser Leu Pro Ala Tyr Leu Asn Ser Leu Asn Asn Phe Leu Leu Arg Val  
 1860 1865 1870  
  
 Asn Met Ser Lys Tyr Asp Ala Ala Arg His Gly Ile Ile Met Tyr Ser  
 1875 1880 1885  
  
 His Pro Tyr Pro Gly Val Gln Asp Gln Glu Gln Ala Thr Ile Ser Ser  
 1890 1895 1900  
  
 Leu Ile Asp Ile Leu Val Ala Leu Ser Ile Leu Met Gly Tyr Ser Val  
 1905 1910 1915 1920  
  
 Thr Thr Ala Ser Phe Val Thr Tyr Val Val Arg Glu His Gln Thr Lys  
 1925 1930 1935  
  
 Ala Lys Gln Leu Gln His Ile Ser Gly Ile Gly Val Thr Cys Tyr Trp  
 1940 1945 1950  
  
 Val Thr Asn Phe Ile Tyr Asp Met Val Phe Tyr Leu Val Pro Val Ala  
 1955 1960 1965  
  
 Phe Ser Ile Gly Ile Ile Ala Ile Phe Lys Leu Pro Ala Phe Tyr Ser  
 1970 1975 1980  
  
 Glu Asn Asn Leu Gly Ala Val Ser Leu Leu Leu Leu Phe Gly His  
 1985 1990 1995 2000  
  
 Ala Thr Phe Ser Trp Met Tyr Leu Leu Ala Gly Leu Phe His Glu Thr  
 2005 2010 2015  
  
 Gly Met Ala Phe Ile Thr Tyr Val Cys Val Asn Leu Phe Phe Gly Ile  
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 Asn Ser Ile Val Ser Leu Ser Val Val Tyr Phe Leu Ser Lys Glu Lys  
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 Pro Asn Asp Pro Thr Leu Glu Leu Ile Ser Glu Thr Leu Lys Arg Ile  
 2050 2055 2060  
  
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 Asn Glu Ser Leu Ile Lys Lys Leu Arg Leu Phe Phe Arg Lys Phe Asn  
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Glu Arg Leu Arg Val Glu Ser Gly Ala Ala Glu Phe Asp Leu Val Gln  
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 Leu Tyr Cys Leu Thr Lys Thr Tyr Gln Leu Ile His Lys Lys Ile Ile  
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 2225 2230 2235 2240  
 Thr Gly Ser Leu Gly His Val Asp Ser His Ser Ser Leu Val Gly Tyr  
 2245 2250 2255  
 Cys Pro Gln Glu Asp Ala Leu Asp Asp Leu Val Thr Val Glu Glu His  
 2260 2265 2270  
 Leu Tyr Phe Tyr Ala Arg Val His Gly Ile Pro Glu Lys Asp Ile Lys  
 2275 2280 2285  
 Glu Thr Val His Lys Leu Leu Arg Arg Leu His Leu Met Pro Phe Lys  
 2290 2295 2300  
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 2305 2310 2315 2320  
 Thr Ala Leu Ala Leu Ile Gly Lys Pro Ser Ile Leu Leu Leu Asp Glu  
 2325 2330 2335  
 Pro Ser Ser Gly Met Asp Pro Lys Ser Lys Arg His Leu Trp Lys Ile  
 2340 2345 2350  
 Ile Ser Glu Glu Val Gln Asn Lys Cys Ser Val Ile Leu Thr Ser His  
 2355 2360 2365  
 Ser Met Glu Glu Cys Glu Ala Leu Cys Thr Arg Leu Ala Ile Met Val  
 2370 2375 2380  
 Asn Gly Lys Phe Gln Cys Ile Gly Ser Leu Gln His Ile Lys Ser Arg  
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 Phe Gly Arg Gly Phe Thr Val Lys Val His Leu Lys Asn Asn Lys Val  
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 Thr Met Glu Thr Leu Thr Lys Phe Met Gln Leu His Phe Pro Lys Thr  
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 Tyr Leu Lys Asp Gln His Leu Ser Met Leu Glu Tyr His Val Pro Val  
 2435 2440 2445  
 Thr Ala Gly Gly Val Ala Asn Ile Phe Asp Leu Leu Glu Thr Asn Lys  
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<210> 8  
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<210> 9  
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<400> 9  
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<220>  
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24

<210> 11  
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<212> DNA  
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28

<210> 12  
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21

<210> 13  
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<212> DNA  
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24

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25

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<210> 15
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<210> 16
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<220>
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      primer

<400> 16
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<210> 17
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<220>
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<210> 18
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<212> DNA
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<220>
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<400> 18
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<210> 19
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primer

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primer

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<220>  
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primer

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| gtatccatgtatccacatc caggagg                         | 27 |
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| <400> 29  |    |
| ccaaagacca gaagtcctat gaaaactgc                     | 28 |
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primer

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18

<210> 33  
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<400> 33  
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18

<210> 34  
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primer

<400> 34  
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22

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primer

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23

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<223> Description of Artificial Sequence: Synthetic  
primer

<400> 36  
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21

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| gagtcctgc caatagaac   |  | 19 |
| <br>  |  |    |
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| <400> 38  |  |    |
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| oligonucleotide   |  |    |
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| cggccgcggc gcgcgcggac cgcctaggat ttaatcgcg gcccgcg                |  | 47 |
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| <211> 68  |  |    |
| <212> DNA   |  |    |
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| oligonucleotide   |  |    |
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| ctctagaatt cggcctccgt ggccgtttaa acgctagcgc ccgggtttaa ttaagtcgac |  | 60 |
| tctagagc  |  | 68 |